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10/710,722

07/30/2004

Hui-Hua Kuo

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04/17/2008

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MERRIFIELD, VA 22116

EXAMINER

HOLDER, ANNER N

ART UNIT

PAPER NUMBER

2621

NOTIFICATION DATE

DELIVERY MODE

04/17/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|--------------------------------------|-----------------------------------|--|
| Office Action Summary | Application No. 10/710,722 | Applicant(s) KUO ET AL. | |
| | Examiner ANNER HOLDER | Art Unit 2621 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01/09/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments see page 6 lines 3-17, filed 01/09/08, with respect to 35 U.S.C 112 rejections have been fully considered and are persuasive. The 35 U.S.C 112 rejections of claims 7, 8, and 11 has been withdrawn.
2. Applicant's arguments filed 01/09/08 have been fully considered but they are not persuasive. As to Applicant's argument regarding claims 1 and 7, Examiner respectfully disagrees. The best match process selects 1 motion vector per macroblock to be stored this technique is well known to one of ordinary skill in art. [see col. 7 lines 46-62; col. 4 lines 48-53 - one motion vector selected] As to Applicant's remarks regarding claims 2, 6, and 12, see Examiner's response above to Applicant's argument as to claims 1 and 7. Regarding Applicant's arguments relating to claim 8, Examiner respectfully disagrees. Hawkins teaches motion vector for a macroblock arrangement which can be modified and varied without departing from the scope of the invention. [See col. 8 lines 1-23; Abstract; Fig. 7; Fig. 9; Col. 5 Lines 37-45; Col. 6 Lines 52-62; Fig. 3; Col. 4 Lines 30-60; It is well known in the art that addresses within memory can be assigned] As to Applicant's arguments regarding claims 13 and 17, Examiner respectfully disagrees. Hawkins teaches a sliding/relative addressing scheme that is not absolute, thus can be modified and varied within the scope of the invention reading upon claim. [See col. 8 lines 5-46] As to Applicant's remarks regarding claims 3-5, 9-11, 14 and 15, see Examiner's response above to Applicant's argument as to claims 13.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 6, 7, 8, 12, 13, 16, 17, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (Hawkins) US 6,519,287 B1.

5. As to claim 1, Hawkins teaches a memory management method used in the decoding process of a video frame, for storing at least one motion vector of a decoded first macroblock as candidate predictor for future use in the decoding process, the method comprising: allocating a first memory space and a second memory space in a first memory, wherein each of the first and the second memory spaces is sufficient for storing one motion vector; [Abstract; Fig. 7; Fig. 9; Fig. 3; Col. 4 Lines 30-42] and when the first macroblock comprises only one first motion vector, storing the first motion vector in the first or the second memory space. [Abstract; Fig. 7; Fig. 9; Col. 5 Lines 37-45; Col. 6 Lines 52-62; Fig. 3; Col. 4 Lines 30-60]

Hawkins does not specifically teach the allocation of a first or second memory space for motion vector storage.

However, it well known in the art to allocate within a memory array, which is taught by Hawkins, a single space or address that can be assigned for a single motion vector. (Official Notice)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hawkins's invention by incorporating the allocation of space within a memory array because it is a standard protocol routinely implemented in memory management system.

6. As to claim 2, Hawkins teaches when the first macroblock comprises a first block, a second block, a third block, and a fourth block, storing the motion vector of the third block in the first memory space and storing the motion vector of the fourth block in the second memory space. [Abstract; Fig. 7; Fig. 9; col. 8 lines 1-23; Col. 5 Lines 37-45; Col. 6 Lines 52-62; Fig. 3; Col. 4 Lines 30-60; It is well known in the art that addresses within memory can be assigned]

7. As to claim 6, Hawkins teaches the first memory is a DRAM, an SRAM, or registers. [Abstract; Col. 2 Lines 55-61; Fig. 9; Fig. 1; Fig. 3; Col. 4 Lines 30-42]

8. As to claim 7, see rejection of claim 1 above.

9. As to claim 8, see rejection of claim 2 above.

10. As to claim 12, see rejection of claim 6 above.

11. As to claim 13, Hawkins teaches a row-based memory management method used in the decoding process of a video frame, for storing the motion vectors of a plurality of decoded macroblocks as candidate predictors for use in the decoding process, wherein each row of the video frame comprises N macroblocks, the method comprising: allocating N memory units in a first memory, wherein each memory unit is sufficient for storing at least one motion vector of one macroblock; [Abstract; Fig. 7; Fig. 9; Fig. 3; Col. 4 Lines 30-42] when a first macroblock

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located at an L_{th} row and a K_{th} column is decoded, storing at least one motion vector of the first macroblock in a K_{th} memory unit of the memory units to overwrite at least one motion vector of a second macroblock previously stored in the K_{th} memory unit, wherein the second macroblock is located at an $(L-1)_{th}$ row and the K_{th} column, K is an integer between 1 and N , and L is an integer larger than 1. [Abstract; Fig. 7; Fig. 9; Col. 5 Lines 37-45; Col. 6 Lines 52-62; Fig. 3; Col. 4 Lines 30-60; It is well known in the art that addresses within memory can be assigned, allocated space can be reused by overwriting and a memory array structure comprises rows and columns]

Hawkins does not specifically teach the allocation of a first or second memory space for motion vector storage.

However, it well known in the art to allocate within a memory array, which is taught by Hawkins, a single space or address that can be assigned for a single motion vector. (Official Notice)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hawkins's invention by incorporating the allocation of space within a memory array because it is a standard protocol routinely implemented in memory management system.

12. As to claim 16, see rejection of claim 6 above.

13. As to claim 17, Hawkins teaches allocating an additional memory unit in a second memory, wherein the additional memory unit is capable of storing at least one motion vector of one macroblock; [Abstract; Fig. 7; Fig. 9; Fig. 3; Col. 4 Lines 30-42] when a third macroblock of

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the video frame is decoded, storing at least one motion vector of the third macroblock in the additional memory unit to overwrite at least one motion vector of a fourth macroblock previously stored in the additional memory unit, wherein the fourth macroblock is decoded immediately before the third macroblock. [Abstract; Figs. 5-7; Fig. 9; Col. 5 Lines 37-45; Col. 6 Lines 52-62; Fig. 3; Col. 4 Lines 30-60; It is well known in the art that addresses within memory can be assigned, allocated space can be reused by overwriting and a memory array structure comprises rows and column]

14. As to claim 18, see rejection of claim 6 above.

15. Claims 3-5, 9-11, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (Hawkins) US 6,519,287 B1 in view of Kondo et al. (Kondo) US 7,116,372 B2.

16. As to claim 3, Hawkins teaches the method of claim 1.

Hawkins does not specifically teach the video frame is a progressive frame.

Kondo teaches the video frame is a progressive frame. [Abstract; Col. 11 Lines 29-48; Co. 11 Line 66 – Col. 12 Line 6]

It would have been obvious at the time the invention was made to incorporate the deinterlacing method of Kondo with the motion vector storage method taught by Hawkins, enabling reduction of degradation of image quality.

17. As to claim 4, Hawkins teaches the method of claim 1.

Hawkins does not specifically teach the video frame is an interlaced frame.

Kondo teaches the video frame is an interlaced frame. [Abstract; Col. 11 Lines 29-48; Co. 11 Line 66 – Col. 12 Line 6]

It would have been obvious at the time the invention was made to incorporate the deinterlacing method of Kondo with the motion vector storage method taught by Hawkins, enabling reduction of degradation of image quality.

18. As to claim 5, Hawkins (modified by Kondo) teaches when the first macroblock comprises a first field and a second field, storing the motion vector of the first field in the first memory space and storing the motion vector of the second field in the second memory space. [Abstract; Col. 11 Lines 29-48; Co. 11 Line 66 – Col. 12 Line 6]

19. As to claim 9, see above rejection of claim 3.

20. As to claim 10, see above rejection of claim 4.

21. As to claim 11, see above rejection of claim 5.

22. As to claim 14, see above rejection of claim 3.

23. As to claim 15, see above rejection of claim 4.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hoang (US 6,295,089 B1); Malinowski (US 4,888,741); Ward et al. (US 4894770).

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25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNER HOLDER whose telephone number is (571)270-1549. The examiner can normally be reached on M-Th, M-F 8 am - 3 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ANH 08/10/08

/Tung Vo/
Primary Examiner, Art Unit 2621